ARTICLE 10

HOW THE DODECAGON ENCODES THE SUPERSTRING PARAMETERS 168, 248, 336 & 1680

by

Stephen M. Phillips

Flat 7, "Grangewood," 40 Norwich Avenue West. Bournemouth.

Dorset BH2 6AW. England.

E-mail: Stephen@smphillips.8m.com
Website: http://smphillips.8m.com

ABSTRACT

The dodecagon has Pythagorean significance vis-à-vis the perfect number 10 because it is the **tenth** regular polygon. It is also the last of the seven regular polygons constituting the inner form of the Tree of Life. This article confirms the special status of the dodecagon by showing how it geometrically embodies in a natural way the numbers 168, 248, 336 & 1680 characterising the 3-dimensional form of the superstring constituent of up and down quarks and their unified dynamics. The number values of the Godnames of the ten Sephiroth are shown to define properties of a single dodecagon and a pair of joined dodecagons, thus indicating that they constitute 'sacred geometry' and must embody such cosmic parameters. This conclusion is confirmed by the simple, beautiful way in which the Pythagorean tetrad expresses their properties. As the last member of the sequence of regular polygons to unfold as the inner Tree of Life, the dodecagon corresponds to Malkuth, the seventh and last Sephirah of Construction, because it encodes information about the 'Malkuth' or objective aspect of the microscopic manifestation of the Tree of Life in space-time.

1. INTRODUCTION

It was shown in Article 9 that the square embodies the structural parameter **168** and the dynamical parameter 248 of the superstring constituent of up and down quarks (the latter embodiment was
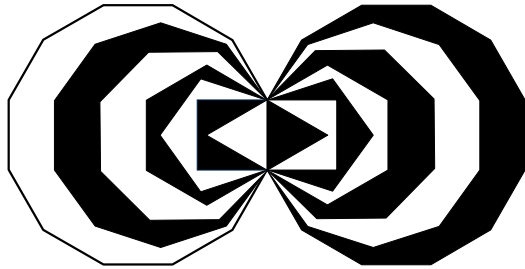

Figure 1

also discussed in Article 1). Although the relevance of these numbers to the physics of the universe was, of course, unknown to the early Pythagoreans, it illustrates in a remarkable way their profound intuition about the fundamental importance of the number 4 to the study of the natural world. But the number 10 was also central to Pythagorean mathematics because it was symbolised by the tetractys as the *fourth* triangular number:

$$10 = \quad \begin{matrix} \bullet \\ \bullet \ \bullet \\ \bullet \ \bullet \ \bullet \\ \bullet \ \bullet \ \bullet \ \bullet \end{matrix}$$

The inner form of the Tree of Life (*fig. 1*) comprises seven enfolded, regular polygons: triangle, square, pentagon, hexagon, octagon, decagon & dodecagon. The last of these — the dodecagon — is the *tenth* regular polygon, counting from the simplest one — the triangle. It should therefore come as no surprise that it, too, embodies numbers of cosmic significance. This article discusses how the dodecagon encodes the numbers **168**, 248, 336 and 1680 as parameters of the superstring.

2. PROPERTIES OF THE DODECAGON

Divided into 12 tetractyses, the dodecagon is made up of **73** yods (*fig. 2*), of which **36** yods are on the boundary and **72** yods surround its centre. **73** is the number value of Chokmah, **36** is the God-
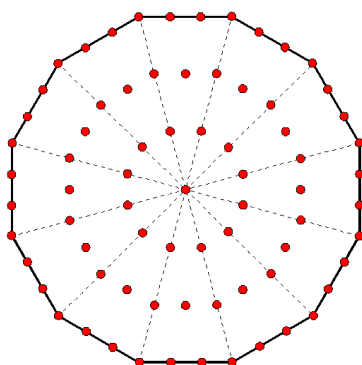
TYPE A

$$73 =$$

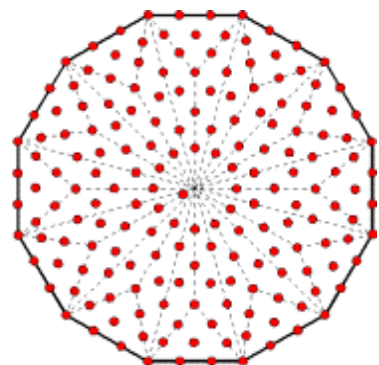
Figure 2

TYPE B

$$181 =$$

Figure 3

name number of Geburah and **72** is the number value of Chesed (see table below). The fact that a Godname —Eloha — prescribes the *shape* of the dodecagon by quantifying how many yods are needed to mark out its boundary is our first sign that the dodecagon constitutes 'sacred geometry'

by embodying a number of cosmic (and therefore scientific) significance. A dodecagon whose sectors are tetractyses (*fig.* 2) will be called 'type A.' A dodecagon whose sectors are three tetractyses (*fig. 3*) will be called 'type B.' This type contains 181 yods.

The properties of both types of dodecagon are listed below. For the sake of reference, the number values of the Sephirothic titles, their Godnames, Archangelic Names, Angelic Names and Mundane Chakras are shown in the following table. Numbers in shaded boxes appear in the list.

Table

Sephirah	Title	Godname	Archangel	Order of Angels	Mundane Chakra
Kether	620	21	314	833	636
Chokmah	73	15, 26	331	187	140
Binah	67	50	311	282	317
Chesed	72	31	62	428	194
Geburah	216	36	131	630	95
Tiphareth	1081	76	101	140	640
Netzach	148	129	97	1260	64
Hod	15	153	311	112	48
Yesod	80	49	246	272	87
Malkuth	496	65, 155	280	351	168

Properties of dodecagon, two separate dodecagons & two joined dodecagons
(Non-bracketed numbers refer to the type A dodecagon; bracketed numbers refer to the type B dodecagon)

1. Number of corners of dodecagon = 12 (12), 24 (24), 22 (22);
2. Number of sides of dodecagon = 12 (12), 24 (24), 23 (23);
3. Number of corners and sides of dodecagon = 24 (24), **48** (**48**), 45 (45);
4. Number of tetractyses = 12 (**36**), 24 (**72**), 24 (**72**);
5. Number of corners of tetractyses = 13 (25), **26** (**50**), 24 (**48**);
6. Number of sides of tetractyses = 24 (60), **48** (120), 47 (119);
7. Number of corners and sides of tetractyses = 37 (85), 74 (170), 71 (167);
8. Number of sides and tetractyses = **36** (96), **72** (192), 71 (191);
9. Number of corners and tetractyses = 25 (61), **50** (122), **48** (120);
10. Number of corners, sides & tetractyses = **49** (121), 98 (242), **95** (239);
11. Number of corners, sides and tetractyses outside root edge = 46 (118), **95** (239), 92 (236);
12. Number of yods = **73** (181), 146 (362), 142 (358). Number of yods other than centres = **72** (180), 144 (360), **140** (356);

13. Number of yods outside root edge = 69 (177), 138 (354), 138 (354);
14. Number of hexagonal yods = 60 (156), 120 (312), 118 (310);
15. Number of hexagonal yods outside root edge = 58 (154), 116 (308), 116 (308);
16. Number of yods on boundaries of dodecagon = **36 (36)**, **72 (72)**, 68 (68). Number of boundary yods outside root edge = 32 (32) 68 (68), **64 (64)**;
17. Number of internal yods = 37 (145), 74 (290), 74 (290);
18. Number of yods on sides of tetractyses = 61 (145), 122 (290), 118 (286). Number of yods on sides of tetractyses outside root edge = 57 (141), 118 (286), 114 (**282**);
19. Number of yods on sides of tetractyses other than corners and centre of dodecagon = **48** (132), 96 (264), 94 (262). Number of such yods outside root edge = 46 (130), 92 (260), 92 (260);
20. Number of yods other than corners and centre of dodecagon = 60 (**168**), 120 (336), 118 (334);
21. Number of yods other than corners of dodecagon and centres of its sectors = **49** (157), 98 (314), 96 (312). Number of such yods outside root edge = 47 (**155**), 94 (310), 94 (310);
22. Number of yods other than corners of dodecagon = 61 (169), 122 (338), 120 (336).

Set out below are the ways in which the Godname numbers prescribe properties of the dodecagon and two separate or joined dodecagons listed above.

Kether: **21**   **21** corners and sides of dodecagon outside the root edge. The type A dodecagon has **73** yods, where **73** = **21**st prime number. Also, there are 121 corners, sides and tetractyses in the type B dodecagon, where

$$121 = 11^2 = 1 + 3 + 5 + \ldots + \mathbf{21};$$

Chokmah:**15**   47 sides of type A dodecagon, where 47 = **15**th prime number;

    26   Two separate, type A dodecagons have 24 tetractyses with **26** corners. Also, number of yods outside the root edge on sides of **72** tetractyses in two joined, type B dodecagons which are not corners or centres of dodecagons = 260 = **26**×10;
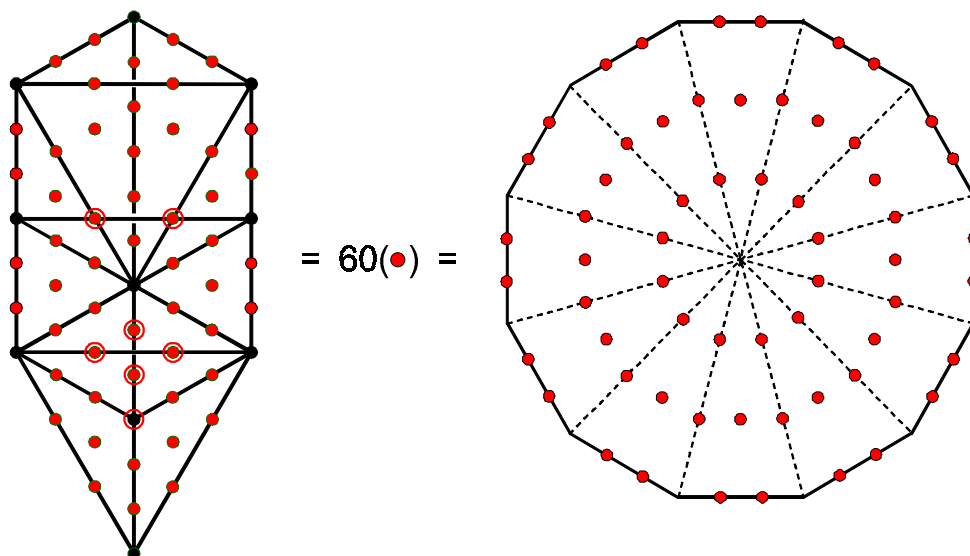

= 60(●) =

Figure 4

Binah: **50**   Two separate, type B dodecagons have **72** tetractyses with **50** corners;

Chesed: **31**   Number of hexagonal yods in two joined, type B dodecagons = 310 = **31**×10. This is also the number of yods outside the root edge of two joined, type B dodecagons

168 =

The dodecagon has 168 yods in 36 tetractyses other than its centre and 12 corners

Figure 5

other than the corners and centres of their sectors;

Geburah: **36**   Number of yods on boundary of dodecagon. Also, the number of tetractyses in the type B dodecagon;

Tiphareth: **76**   Number of hexagonal yods outside root edge of type B dodecagon = 154 = 77th even integer. 77 = **76**th integer after 1;

Netzach: **129**   Number of yods outside root edge on sides of **36** tetractyses other than corners or centre of type B dodecagon = 130 = **129**th integer after 1;

Hod: **153**   Number of hexagonal yods outside root edge of type B dodecagon = 154 = **153**rd integer after 1;

Yesod: **49**   Number of corners, sides and tetractyses of type A dodecagon = **49**;

Malkuth: **65**   Number of yods outside root edge on sides of tetractyses other than corners and centre of type B dodecagon = 130 = **65**th even integer;

155   **155** hexagonal yods associated with each joined, type B dodecagon. Also, the number of yods outside the root edge of the type B dodecagon other than its corners and centres of its sectors.


3. ENCODING OF SUPERSTRING PARAMETER 168

The type A dodecagon has 60 yods other than corners surrounding its centre (*fig. 4*), whilst the type B dodecagon has **168** yods other than corners surrounding its centre (*fig. 5*). Compare this with what was found for the square in Article 9: the type B square with three tetractyses as each sector has 60 yods surrounding its centre, whilst the type C square with nine tetractyses as each sector has **168** yods surrounding its centre. Polygons of type A, B, C, etc represent successive levels of complexity in their construction from tetractyses. What is so remarkable and significant

Figure 6

155 yods   155 yods
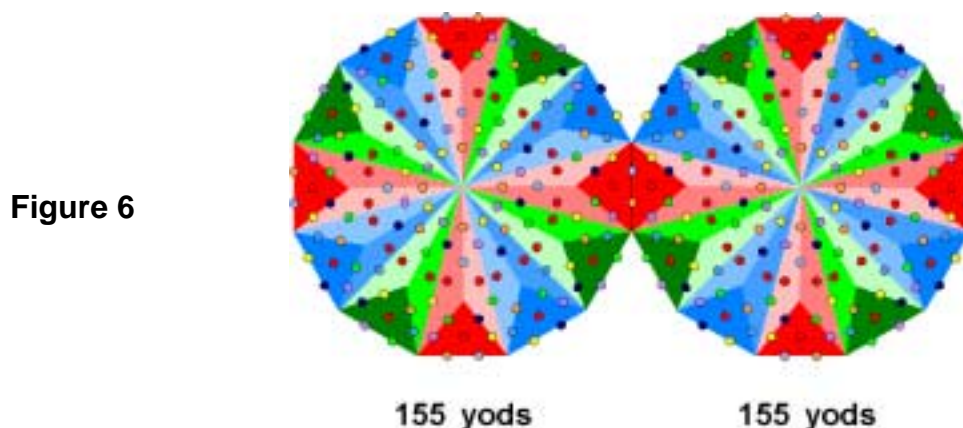
in the context of the special emphasis given by the Pythagoreans to the number 10 and to the tetrad symbolised by the square is that both the square and the tenth regular polygon embody the *same* pair of numbers, although differently. **168** is just the number of extra yods required to turn the twelve sectors of a dodecagon into tetractyses. In the case of the outer form of the Tree of Life, there are 60 extra yods needed to construct it from tetractyses, whilst all the enfolded polygons other than a dodecagon have 60 corners. The dodecagon bears to the first six polygons the same
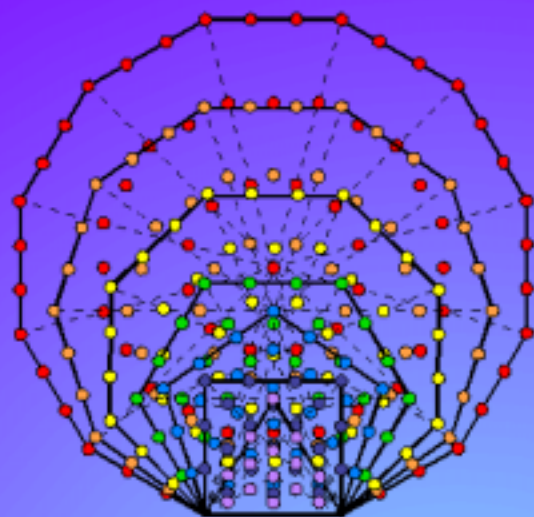
Figure 7

= 260 =
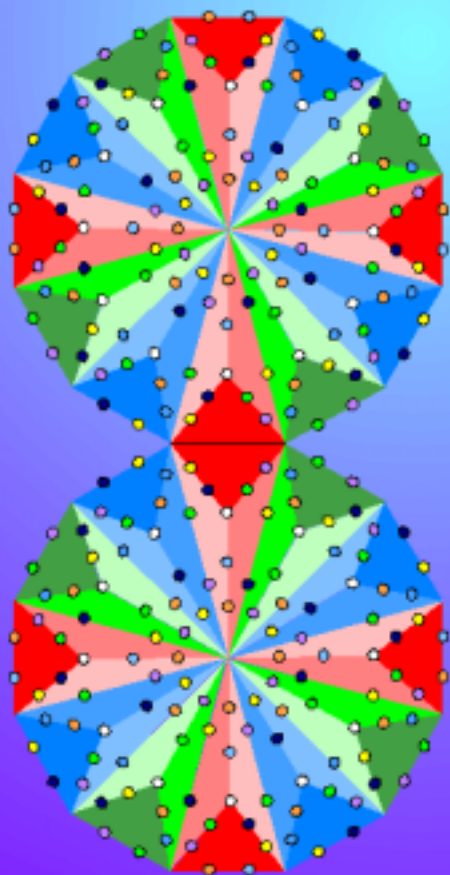
Two joined dodecagons have outside their root edge on sides of their 72 tetractyses as many yods (260) other than their corners and centres as 7 enfolded polygons have yods outside their root edge

relation as Malkuth bears to the six higher Sephiroth of Construction. This is confirmed by the fact that there are **155** hexagonal yods associated with each joined, type B dodecagon (*fig. 6*), whilst it has **168** yods other than corners of its sectors, where **155** is the number value of Adonai Melekh, Godname of Malkuth, and **168** is the number value of Cholem Yesodeth, the Mundane Chakra of this Sephirah. The Godname EL prescribes the pair of joined dodecagons because they contain (**155** + **155** = 310)

$$
= \quad
\begin{array}{c}
\textbf{31} \\
\textbf{31} \quad \textbf{31} \\
\textbf{31} \quad \textbf{31} \quad \textbf{31} \\
\textbf{31} \quad \textbf{31} \quad \textbf{31} \quad \textbf{31}
\end{array}
$$

hexagonal yods, where **31** is its number value.

Further remarkable confirmation that the dodecagon constitutes sacred geometry because its properties are prescribed by Godnames is the fact that, outside its root edge, the type B dodecagon contains 260 yods on the sides of its **36** tetractyses that are not its corners or centre, where

$$
260 = \quad
\begin{array}{c}
\textbf{26} \\
\textbf{26} \quad \textbf{26} \\
\textbf{26} \quad \textbf{26} \quad \textbf{26} \\
\textbf{26} \quad \textbf{26} \quad \textbf{26} \quad \textbf{26}
\end{array}
$$

and **26** is the number value of Yahweh, Godname of Chokmah. Compare this with the fact that the seven enfolded, regular polygons contain 260 yods outside their shared root edge (*fig. 7*). In the first case, this number is that needed to delineate the edges of its tetractyses outside the root edge, given its corners and centre; in the second case, it is the number of yods required to construct the seven enfolded polygons, starting with the root edge. The ways in which the generative Godname Yahweh prescribes both geometrical objects are analogous.

4. ENCODING OF 1680 IN PAIR OF JOINED DODECAGONS

It was shown in Article 9 that, when the yods in a square constructed from tetractyses are themselves replaced by tetractyses (*fig. 8*), there result 248 yods other than corners of tetractyses, that is, yods symbolising the seven Sephiroth of Construction. These symbolise the 248 quantum
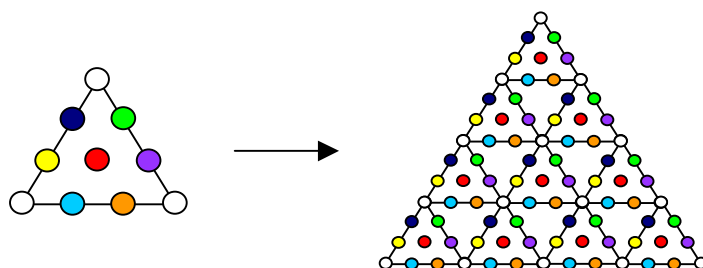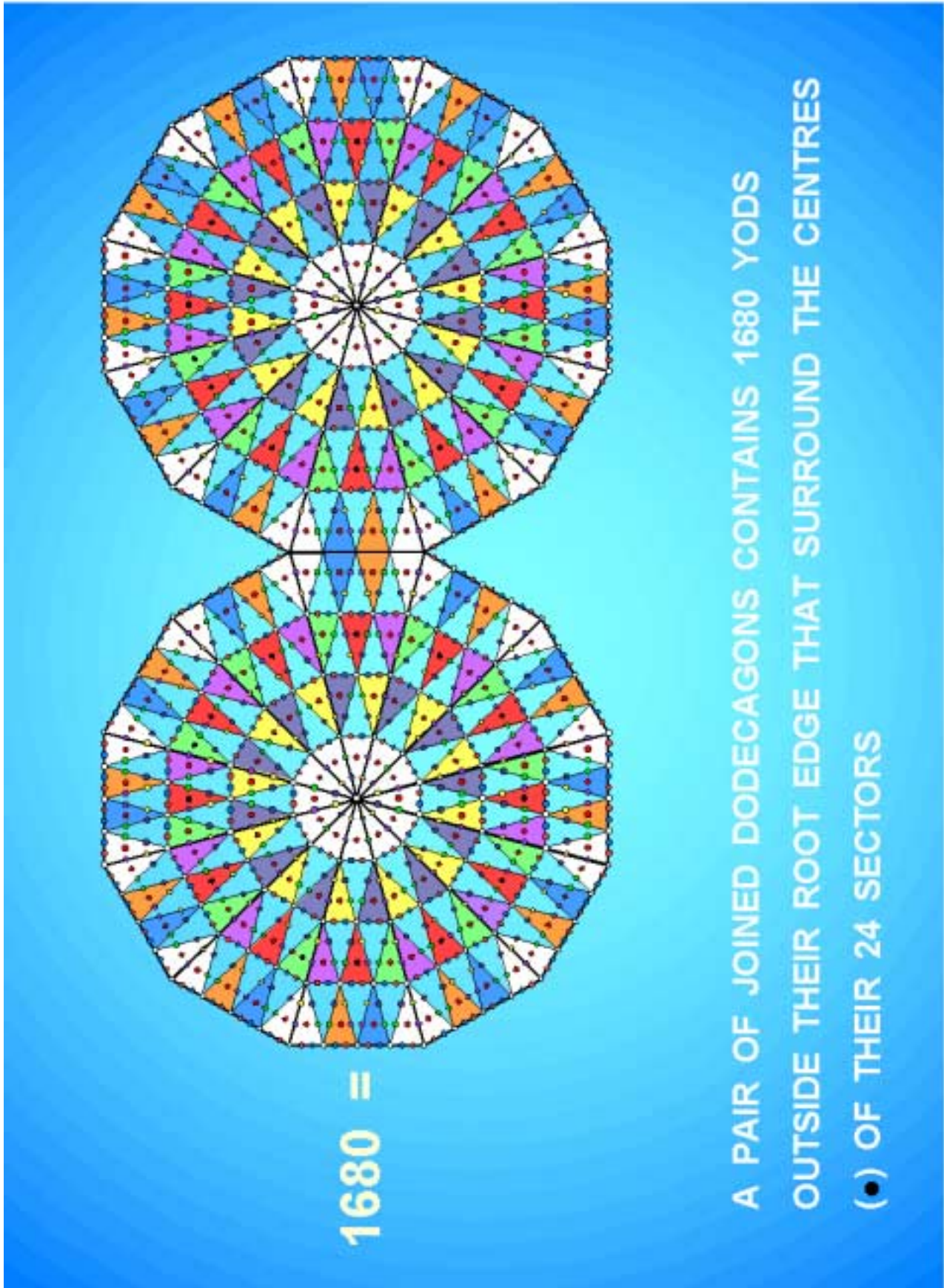

Figure 8

1680 =

A PAIR OF JOINED DODECAGONS CONTAINS 1680 YODS

OUTSIDE THEIR ROOT EDGE THAT SURROUND THE CENTRES

(•) OF THEIR 24 SECTORS

Figure 9

states of the particle transmitting the unified superstring force described by the gauge symmetry group E_8. A dodecagon with its sectors turned into such higher-order tetractyses contains 120 tetractyses, where

$$120 = \begin{array}{|c|} 2^2 \qquad 4^2 \\ \hline \\ \hline 8^2 \qquad 6^2 \end{array}$$

showing how the tetrad determines this number. 120 is the sum of the first *ten* odd integers after 1:

$$120 = 11^2 - 1 = 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + \mathbf{21}.$$

The number of yods in each sector is

$$85 = \begin{array}{|c|} 4^0 \qquad 4^1 \\ \hline \\ \hline 4^3 \qquad 4^2 \end{array}$$

again illustrating the role of the tetrad. Excluding the shared vertices of the triangular sectors, which is the centre of the dodecagon, there are **72** yods per sector, where **72** is the number of Chesed, the *fourth* Sephirah from the top of the Tree of Life. Of these, 10 (= 1 + 2 + 3 + 4) are corners of tetractyses symbolising Kether, Chokmah and Binah and **62** are yods at corners and centres of hexagonal arrays symbolising Sephiroth of Construction, where **62** is the number value of Tzadkiel, the Archangel corresponding to Chesed. The total number of yods in the 120 tetractyses of a dodecagon = 12×**72** + 1 = 865. There are 13 yods along the shared edge of the pair of dodecagons, leaving (865 − 13 = 852) yods outside the root edge. The number of yods outside the root edge surrounding the centres of each sector = 852 − 12 = 840, where

$$840 = \begin{array}{cccc} & 84 & & \\ & 84 & 84 & \\ 84 & 84 & 84 & \\ 84 & 84 & 84 & 84 \end{array}$$

and

$$84 = \begin{array}{|c|} 1^2 \qquad 3^2 \\ \hline \\ \hline 7^2 \qquad 5^2 \end{array}$$

yet again illustrating the basic role of the tetrad in defining properties of sacred geometry with

cosmic significance (as will become evident shortly). A pair of joined dodecagons therefore has
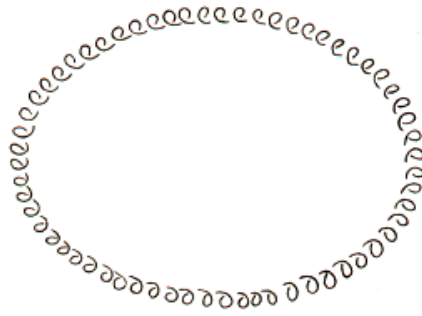

1680 coils in a whorl **Figure 10**

(840 + 840 = 1680) yods outside their shared edge surrounding the centres of their 24 sectors, where 24 = 1×2×3×4 (*fig. 9*). This is the number of turns in each of the ten helical whorls (*fig. 10*) of the 'ultimate physical atom,' or UPA (*fig. 11*), observed over 100 years ago by the two Theosophists Annie Besant and C.W. Leadbeater, using a siddhi, or psychic ability, known to Indian yoga. Each whorl makes 2½ outer revolutions about the vertical axis of spin of the UPA and 2½ inner revolutions, spiralling 840 times in circles in each half. We see that each dodecagon containing 840 yods distributed outside the root edge about the centres of its sectors encodes the number of coils in half a whorl; the two identical dodecagons correspond to the inner and outer halves of a whorl. The 'Malkuth' leve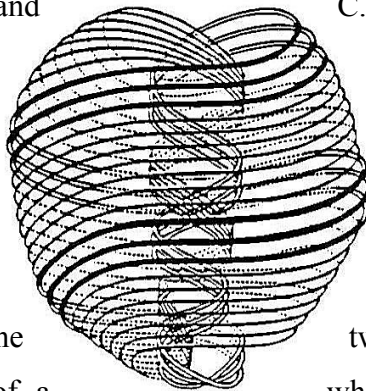l of the microscopic Tree of Life, that is, the ten **Figure 11** string components of the superstring, is encoded in the tenth regular polygon and in the last of those constituting the inner form of the Tree of Life. Each one of the 1680 yods both shaping the pair of dodecagons and surrounding the centres of their 24 sectors denotes a circularly polarised oscillation in the string/whorl. These yods represent the 'material' manifestation of the 240 tetractyses of the 24 higher-order tetractyses making up the pair of dodecagons. The question arises: what do these higher-order tetractyses denote? Twenty-four of them are associated with each whorl, that is, 240 higher-order tetractyses are associated with the UPA itself. The gauge symmetry group E_8 describing the unified superstring force has 240 so-called 'generators' corresponding to the 240 so-called 'non-zero roots of its Lie algebra.' To each generator corresponds a kind of charge analogous to the electric charge of a particle. Each charge is the source of a gauge field, i.e., a particular kind of force. Each higher-order tetractys represents a gauge charge, and 24 such charges circulate as waves along each whorl, making a total of (10×24 = 240) for the superstring itself. As 1680 = 24×70 and the Tree of Life comprises 70 yods when its 16 triangles are turned into tetractyses (see Figure 4), this number is the number of yods in 24 *separate* Trees of Life. This reflects the fact that the 24 gauge

charges manifesting in each whorl are all independent and 'smeared' along its length in a way analogous to that proposed in the $E_8{\times}E_8$ heterotic model of the superstring. 70 is also the number of yods corresponding to Sephiroth of Construction in the higher-order tetractys making up each sector of the dodecagons, showing again that the gauge charges are *wholes* — complete Tree of Life entities in themselves.

The last statement should answer the following question that may have arisen in the reader's mind during the discussion above of how the number 1680 was embodied in the pair of dodecagons: what, if any, is the significance of the seemingly arbitrary way in which the 840 yods in each dodecagon were selected? The yod at the centre of a tetractys denotes Malkuth, the material manifestation of the whole symbolised by the tetractys. The six yods surrounding it at the corners of a hexagon denote the six stages preceding this final physicalisation. There are 84 yods surrounding the centre of the next higher-order tetractys (see Figure 8). On the cosmic level these correspond to the 42 subplanes of the six *superphysical* planes of being and the 42 subplanes of their cosmic counterpart (see Article 5 for more details). On the microcosmic level they denote the number of times a string oscillates as circularly polarised waves as it makes one-quarter of a revolution about the axis of the UPA, i.e., effectively, a 90° turn in space. In conformity with its 10-fold nature — both in ordinary space and in 10-dimensional space-time — each string makes *ten* half-revolutions, five in an outer twisting and five in a more tightly knit, double helical twist. This 5:5 split corresponds to the division in the Tree of Life between the five uppermost Sephiroth, which span its Upper Face, and the five lowest Sephirah forming its Lower Face. The yod at the centre of a higher-order tetractys denotes the Malkuth level and so does not enter the count of the yods symbolising differentiations of Sephiroth *beyond* Malkuth for each independent Tree of Life entity, namely, the 24 gauge charges spread out along each whorl. What appears at first sight to be just a contrived choice of yods made to generate the number 840 in each dodecagon is in fact a selection *dictated* by the proper physical interpretation of their higher-order tetractys sectors.

Another similarity between the powers of the square and dodecagon to embody various superstring
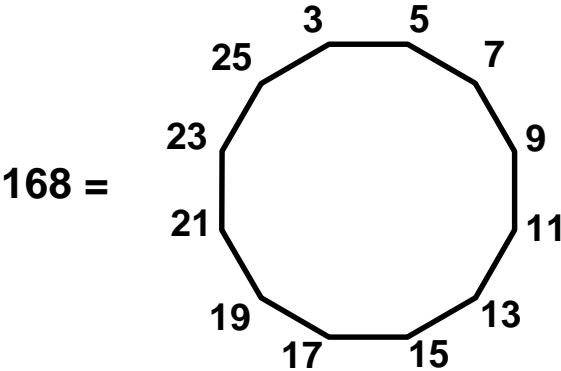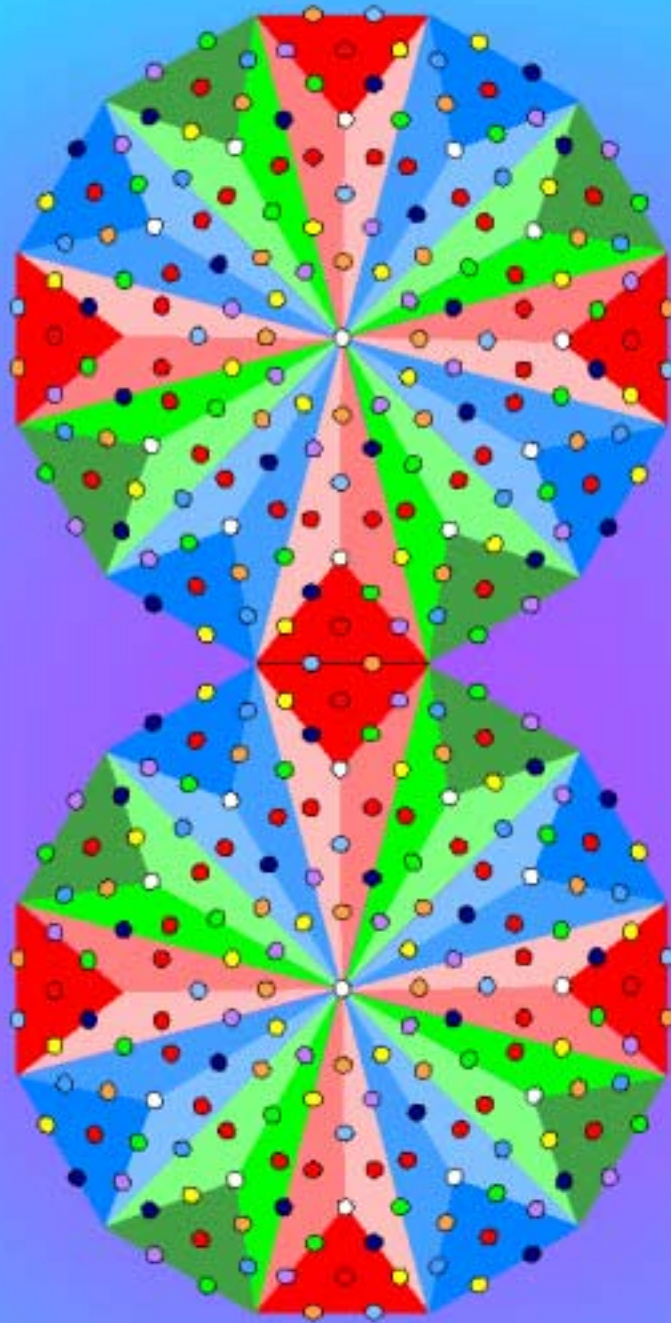

Figure 12

336 =

TWO JOINED DODECAGONS CONTAIN 336
YODS OTHER THAN THEIR 22 CORNERS

Figure 13

parameters like 248 and **168** is the fact that the latter number is the sum of the first 12 odd integers after 1 (*fig. 12*) and that the shapes of both polygons are defined by the number 12 because a square divided into tetractyses has 12 yods along its boundary, whilst a dodecagon is delineated by its 12 corners. As the template for constructing objects possessing sacred geometry, the tetractys unveils a beautiful harmony between geometry and arithmetic that exists *only in such objects*.

5. ENCODING OF 336 IN THE PAIR OF DODECAGONS

Two joined dodecagons have 22 corners, where

$$22 = \begin{array}{c} 1^4 \qquad 2^3 \\ \square \\ 4^1 \qquad 3^2 \end{array}$$
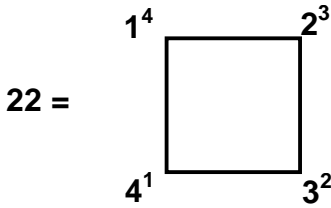
This illustrates once more how the integers 1, 2, 3, & 4 express properties of the dodecagon. As there are 22 compactified dimensions in **26**-dimensional space-time, each corner of a dodecagon can be thought of as symbolising the *higher* dimensions of space. The ten corners outside the root edge of one dodecagon symbolise the ten curled-up dimensions generating the ten string components of the superstring (see Article 2). The twelve corners of the other dodecagon denote the twelve remaining compactified dimensions. These consist of the five dimensions that define a compactified space whose symmetry generates the superstring gauge group E_8 and the seven curled-up dimensions predicted by supergravity theory.

Notice that the division:

$$22 = 3 + 7 + 12$$

of the 22 letters of the Hebrew alphabet into the three mothers: aleph, mem & shin, the seven double consonants: beth, gimel, daleth, caph, pe, resh, & tau, and the twelve simple consonants has a remarkable geometrical counterpart in the 22 corners of the pair of joined dodecagons. This is because the three mother letters correspond to three corners symbolising the curled-up dimensions that generate the three major whorls of the UPA, the seven double consonants correspond to seven corners that denote the curled-up dimensions generating its seven minor whorls and the twelve simple consonants correspond to the corners of the other dodecagon symbolising the five E_8-generating dimensions and the seven curled-up, supergravity dimensions.

Property number 22 in the list given in Section 2 states that the number of yods in two joined dodecagons other than their 22 corners is 336 (*fig. 13*), where

$$336 = \begin{array}{cc} 2^2 & 6^2 \\ 14^2 & 10^2 \end{array}$$

Starting with the *tetrad*, $2^2 = 4$, the sum of the squares of the *four* integers 2, 6, 10 & 14 spaced *four* units apart is 336. It was stated in the last section that the inner and outer halves of a whorl makes 2½ revolutions. This means that its 1680 turns are spread over five revolutions, 336 turns
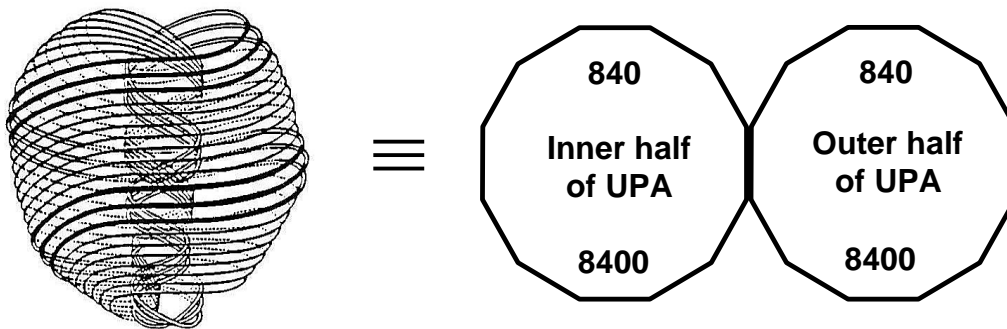

Figure 14

per revolution. Each turn in a revolution of a whorl is symbolised by a yod in the two joined, type B dodecagons other than their 22 corners and two centres, that is, *new yods generated by their construction from tetractyses*. The **168** such yods in each dodecagon denote the number of circularly polarised oscillations made during the traverse of either half of one revolution of the whorl.

With their sectors turned into the next higher-order tetractys after the Pythagorean tetractys, each dodecagon was found earlier to contain 840 yods outside their root edge surrounding their centres. Each dodecagon represents half of a whorl made up of 840 coils (*fig. 14*). Enfolded in each Tree of Life belonging to CTOL are the two sets of seven regular polygons. The lowest ten Trees of Life have **140** enfolded polygons, where **140** is the number value of Masloth, the Mundane Chakra of Chokmah. Their 20 dodecagons contain (10×1680 = 16800) yods outside their root edges surrounding the centres of their sectors. This Tree of Life representation of the superstring shows that the Godname Adonai prescribes the number 16800 because its number value **65** is the number of SLs in the lowest ten trees of CTOL. The number of corners of the 70 polygons enfolded on either side of these trees is **351**, which is the number value of Ashim, the Order of Angels assigned to Malkuth. **351** is also the sum of the first **26** integers, showing how the Godname Yahweh with number value **26** prescribes the ten overlapping Trees of Life representing the ten whorls of the superstring. Each dodecagon has ten corners outside its root edge. The ten dodecagons enfolded in

the lowest ten trees have (10×10 = 100) external corners. This means that the 60 polygons enfolded on either side of the ten trees that are not dodecagons have (**351** – 100 = 251) corners. Article 5 discussed the significance of the number 251 in relation to the superstring. The concurrence *in the same context* (the lowest ten trees) of this structural parameter encoded in the first six types of polygons with the number 16800 encoded in the seventh type is remarkable evidence of the Kabbalistic basis of superstring theory and the author's identification of the UPA
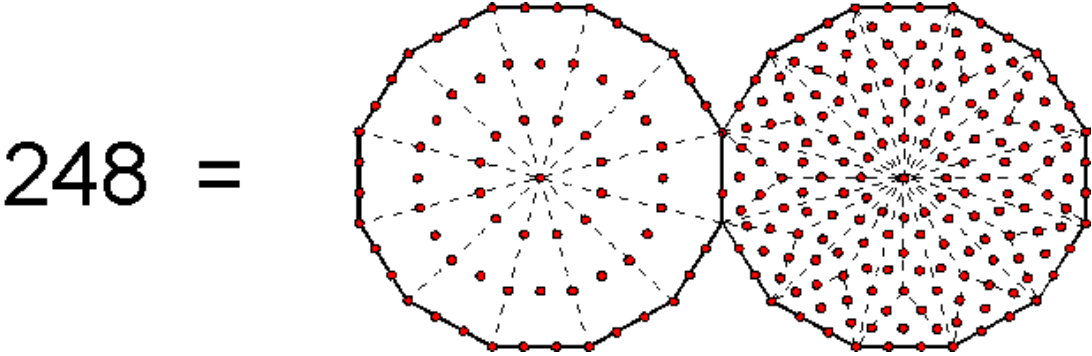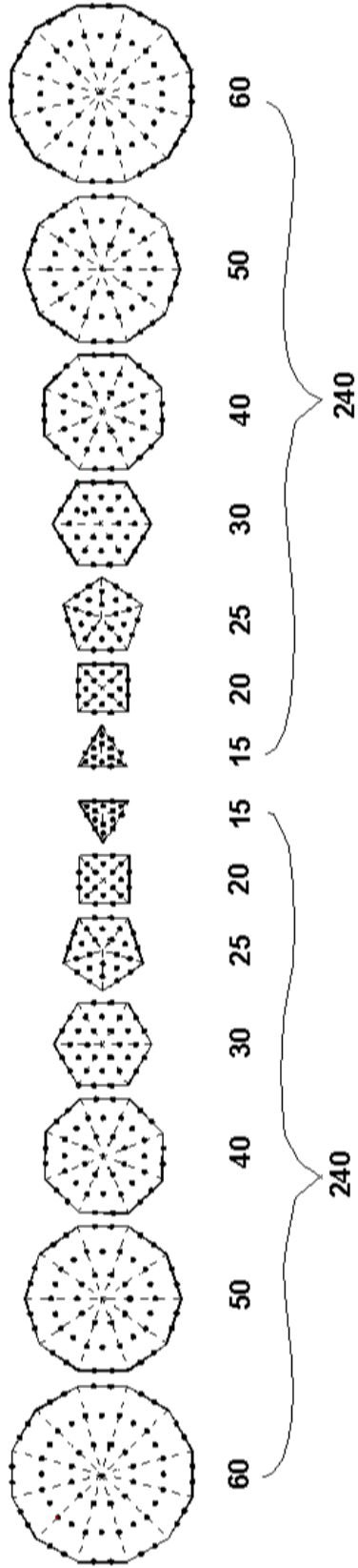

Figure 15

as a superstring. Notice that the proportion of the dodecagons to the first six types enfolded in ten trees, namely, 10:60, corresponds in the tetractys-transformed Tree of Life to the 10:60 pattern of yods created by the ten Sephiroth and the 60 hidden yods. Indeed, the inner form of the Tree of Life has the *same* pattern, namely, the ten corners of a dodecagon outside the root edge shared with the other 13 polygons with 60 corners. Just as the points where the ten Sephiroth are located define the basic geometrical aspect of the Tree of Life — its Malkuth level — so their counterpart in its inner form — the pair of dodecagons — quantitatively embodies the objective nature of the Tree of Life in the subatomic world as measured by the 1680 coils in each helical string making up a superstring. One can only affirm the hermetic axiom: "as above, so below."

6. ENCODING OF 248 & 168 IN TYPE A AND TYPE B DODECAGONS

Suppose that one of the dodecagons is type A and that the other is type B. The former contains **73** yods and the latter has 181 yods. The pair of joined dodecagons has 250 yods. As Articles 5 and 6 discuss in more detail, the ten independent **26-**dimensional string components of the superstring/UPA have 10×25 = 250 spatial coordinate variables. We see that the two types of dodecagon embody the number of variables defining the positions of ten points in **26-**dimensional space-time. 248 yods surround the centres of the joined dodecagons. There are **246** yods outside the root edge, where **246** is the number value of Gabriel, Archangel of Yesod. Two of the yods of the root edge are shared with the Tree of Life. There are therefore 248 yods in the pair of joined

The (240+240) hexagonal yods of the (7+7) regular polygons correspond to the (240+240) non-zero roots of the superstring symmetry group $E_8 \times E_8$

Figure 16

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dodecagons that are *not* shared with the Tree (*fig. 15*). These yods symbolise the 248 gauge bosons that transmit the unified superstring force. According to the properties listed on pages 3 and 4, the type A dodecagon has **49** geometrical elements, where **49** is the number of El Chai, Godname of Yesod, and the type B dodecagon has 121 geometrical elements. The pair of separate dodecagons has 170 geometrical elements, that is, they have **168** geometrical elements surrounding their centres. In other words, *168 geometrical elements are needed to construct their 48 tetractyses, starting from their two centres*. The pair of *joined* dodecagons encodes the superstring dynamical parameter 248 and the pair of *separate* dodecagons encodes its structural parameter **168**! This is additional remarkable evidence of how the Malkuth aspect of the microscopic manifestation of the Tree of Life is encoded in the last of the regular polygons constituting its inner form.

48 is the number value of Kokab, Mundane Chakra of Hod, the Sephirah signifying the mind. Previous articles has discussed how this number is a parameter of the Tree of Life, being the number of corners of the seven separate, regular polygons making up its inner form. Its superstring interpretation is as follows: as discussed earlier, each of the 24 gauge charges carried by a string component of the superstring/UPA manifests as a circularly polarised standing wave. Each such wave has two orthogonal, plane wave components that are 90º out of phase. Each string/whorl therefore has $2 \times 24 = $ **48** independent standing plane waves, each of which is represented in the pair of joined dodecagons by a tetractys, the symbol of wholeness that characterises each wave. The ten whorls of the UPA/superstring comprise ($10 \times$ **48** $ = 480$) plane waves. The encoding of these in the inner form of the Tree of Life is the set of 240 hexagonal yods in either set of seven separate regular polygons, i.e., their 480 hexagonal yods (*fig. 16*). Every hexagonal yod in one set is the mirror image of its counterpart in the other set. Every such pair denotes the two orthogonal plane waves making up each of the 24 circularly polarised oscillations in each of the ten strings of the superstring constituent of up and down quarks paranormally described over a century ago by the Theosophists Annie Besant and C.W. Leadbeater.

7. CONCLUSION

The dodecagon and the pair of joined dodecagons in the inner form of the Tree of Life can be transformed into two types, depending on whether their sectors are turned into single tetractyses or three tetractyses. The ten Godname numbers prescribes their resulting properties, suggesting that they embody numbers of cosmic significance. This is confirmed by the way they encode the numbers **168** and 336, these being the number of coils in, respectively, half and one revolution of a string component of the superstring constituent of up and down quarks, proved by the author to have described paranormally with a yogic siddhi over a hundred years ago by the two

Theosophists Annie Besant and C.W. Leadbeater. A pair of dodecagon is found to embody the number (1680) of such coils in all five revolutions of the string when its sectors are constructed from the next higher-order tetractys. As each of the ten strings of the superstring is a 'branch' of the Tree of Life corresponding to one of its Sephirah, it, too, can be represented by a Tree of Life. This means that the superstring is represented by ten overlapping trees, in whose inner forms are enfolded 20 dodecagons containing 16800 yods that are outside their root edges and surround the centres of their 240 sectors. These correspond to the 16800 coils in the superstring. They denote circularly polarised oscillations in its ten strings generated by the 240 gauge charges of the superstring symmetry group E_8, which are 'smeared' along each string, 24 per string. These gauge charges are the physical meaning of the 24 higher-order tetractys sectors in the pair of dodecagons enfolded in each overlapping Tree of Life as the last of the regular polygons constituting its inner form. A type A dodecagon and a type B dodecagon separately have **168** geometrical elements surrounding their centres, whilst, joined together, they have 248 yods unshared with the outer form of the Tree of Life and 248 yods surrounding their centres. These yods symbolise the 248 gauge bosons of E_8 Superstring physics has been reduced to geometry and then to number as its generating principle. Truly, as the Pythagoreans declared: "Number is form and form is number."